

ABSTRACT

A via contact is provided to a diffusion region at a top surface of a substrate which includes a single-crystal semiconductor region. The via contact includes a first layer which consists essentially of a silicide of a first metal in contact with the diffusion region at the top surface. A dielectric region overlies the first layer, the dielectric region having an outer surface and an opening extending from the outer surface to the top surface of the substrate. A second layer lines the opening and contacts the top surface of the substrate in the opening, the second layer including a second metal which lines a sidewall of the opening and a silicide of the second metal which is self-aligned to the top surface of the substrate in the opening. A diffusion barrier layer overlies the second layer within the opening. A third layer including a third metal overlies the diffusion barrier layer and fills the opening.